

CHAPTER 17.18

TRAIL LOCATION AND CONSTRUCTION STANDARDS

17.18.010: GENERAL GUIDELINES:

The following guidelines provide specific recommendations for how trails should be routed and/or constructed to reduce maintenance and environmental impacts and should be followed in the construction of trails:

- A. Trails should be located and constructed in such a manner as to minimize maintenance and maximize access.
- B. Trails should follow natural contours where possible and respect surrounding land forms. For example, trails crossing steep sites should flow with the land form.
- C. Drainage features, such as water bars, should be constructed where appropriate to reduce erosion.
- D. Trail slopes should match expected user volumes and types. Refer to AASHTO "Guide For The Development Of Bicycle Facilities" for further guidance. (Ord. 2002-04, 3-20-2002)

17.18.020: LOCATION, BONDING, PHASING, AND LIABILITY FOR TRAILS:

- A. Location: Where feasible, trails should be separated from vehicle traffic.
- B. Bonding For Trail Improvements: Where trails are required as part of a development project, a security or bond will be posted for the full cost of the trail improvements. This is required prior to the recording of final plats.
- C. Phasing Of Trail Improvements: When trails are part of a phased project, the phasing of various trail segments will follow a logical sequence for trail users. Some trail construction may be required through an entire project to provide completed trail connections at an early phase in the project.
- D. Trail Rights Of Way And Easements: All trails that are open to the public should be located on publicly dedicated property, or dedicated easements for such purposes. There are a variety of mechanisms for this to occur. Public street rights of way and dedicated easements are the most common and acceptable forms of access rights. The trails map provides recommended right of way widths for the various trail types.
- E. Trail Easement Liability: In cases where public easements are dedicated, or lease agreements are negotiated for public use with private landowners, the jurisdiction should assume general liability responsibility in the same manner as assumed for streets and other public areas. (Ord. 2002-04, 3-20-2002)

17.18.030: RECOMMENDATIONS FOR ENVIRONMENTALLY SENSITIVE SITES:

- A. Special location or construction methods may be necessary to reduce impacts and minimize disturbance in environmentally sensitive areas. Examples of visually or environmentally sensitive sites include: flood zones, highly visible hillsides, significant vegetation areas, highly erodible soils, unstable slopes, and ridgelines.
- B. Techniques, such as site specific trail routing, erosion control measures, site specific adjustment of construction standards, and site specific construction practices should be implemented to minimize environmental, visual or construction impacts. Construction methods that should reduce impacts include installing retaining walls to reduce cut and fill slopes on a visually prominent hillside, hand

construction of the trail, stabilizing a mine hazard that is located within or adjacent to a trail corridor or installing a tree well around a significant tree to be preserved.

C. Each environmentally sensitive site is unique, specific trail proposals through such locations need to be considered on a case by case basis. (Ord. 2002-04, 3-20-2002)

17.18.040: GUIDELINES FOR SENSITIVE SITES:

A. Construction Practices For Sensitive Sites: Disturbance fencing limits should be implemented to minimize construction impacts. Construction limits should be as small as practical to construct the trail. Significant vegetation root zones should be considered when locating the trail and establishing construction limits.

B. Erosion Control: Methods should be employed to protect areas adjacent to the trail from impacts both during and after construction. (See Drainage Planning and Slope Management Guidelines sections.)

C. Indigenous Materials: Indigenous construction materials should be used for retaining walls, bridges, and barriers wherever possible.

D. Existing Vegetation: Existing significant vegetation should be preserved wherever possible. Trees, riparian vegetation, scrub oak, and rare plants are considered significant. Root zones, as well as aboveground vegetation require protection when preserving plants. In general, the area within the drip line of trees, especially on the down slope side of the vegetation, is sensitive to disturbance. If root zones are impacted or grades are changed significantly, temporary irrigation may be necessary.

E. Revegetation: Native and/or self-sustaining plant materials should be used for revegetation of all disturbed areas where trails pass through native or nonirrigated sites. Revegetation can be used to provide screening. Construction techniques to preserve vegetation and trail routing techniques should be used to minimize visual intrusion.

F. Natural Considerations: Where significant wildlife or other natural features exist, special trail routing, construction methods and trail use should be considered.

G. Visually Sensitive Areas: Locations that are visually sensitive, such as tallus slopes, may require reduced cut and fill slopes, hand construction, and low retaining walls to minimize site disturbance and visual intrusion.

H. Environmentally Hazardous Areas: Where environmental hazards are present, special trail construction techniques or locations should be used to mitigate the hazard. Hazardous areas can be abandoned mine sites, where mine tailings should be stabilized, top soiled and revegetated. Other hazardous locations, such as lightning prone areas, rockslide and avalanche areas should either be avoided or be closed seasonally when hazardous conditions are a problem.

I. Microclimatic Trail Use Opportunities: Locate the trails for both summer and winter activities, where possible, given the terrain and climatic considerations. Identify snow retention areas for possible cross country ski trails. In open areas, place trail alignment to take advantage of wind protection and shaded canyon areas. (Ord. 2002-04, 3-20-2002)

17.18.050: UTILITIES:

The routing of utilities within trail corridors is generally encouraged. Many trail managers have allowed colocation of utilities in consideration for appropriate fee payments by the utility company. Locations that are visually or environmentally sensitive may restrict or preclude sharing utilities with

trails. The following guidelines for placement, site disturbance and access should be followed:

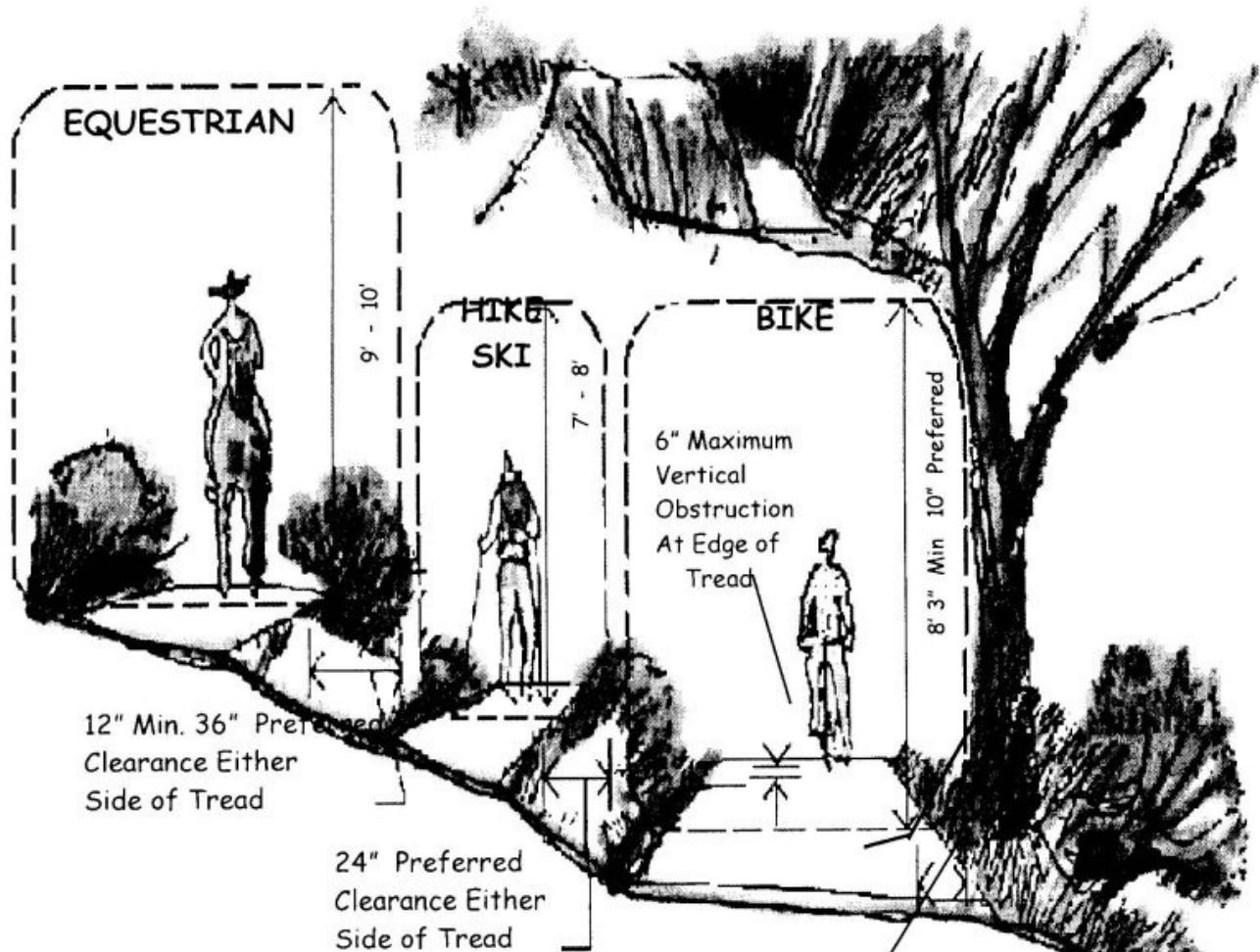
A. Placement: Utility lines that run parallel to the trail should be placed under the trail bed where possible to minimize site disturbance. Utility lines that are perpendicular to the trail and lateral lines should be located to minimize site disturbance and removal of significant vegetation. Physical obstructions, such as utility pedestals, transformers and the like should be located out of the clear zone so they are not hazards to trail users. Access points which are not a physical obstruction, such as manhole covers should be located flush with the trail surface and where they do not pose a hazard to trail users.

B. Site Disturbance: Construction of utility lines within naturally vegetated areas should minimize site disturbance wherever possible. All disturbances should be revegetated according to the requirements for trail construction. Bonding for this work should be required.

C. Utility Access: Access for utility maintenance vehicles will be evaluated on a case by case basis and provided for as part of the trail construction. Visually or environmentally sensitive sites may preclude full access to trail/utility corridors. (Ord. 2002-04, 3-20-2002)

17.18.060: VERTICAL CLEARANCE GUIDELINES:

A ten foot (10') vertical clearance from the trail surface is recommended. The vertical clearance to obstructions will be a minimum of eight feet (8') across the clear width of the path.



(Ord. 2002-04, 3-20-2002)

17.18.070: TRAIL SURFACING GUIDELINES:

Asphalt, concrete and base specifications will meet those set forth in this document. The six foot (6') crushed rock trail surfaces may be substituted with a compacted two inch (2") dolomite limestone material meeting the following specifications:

Passing 1/2" screen - 100%

Passing 3/8" screen - 97-99%

Passing #4 screen - 75-80%

Passing #8 screen - 50-55%

Passing #16 screen - 30-35%

Passing #30 screen - 20-25%

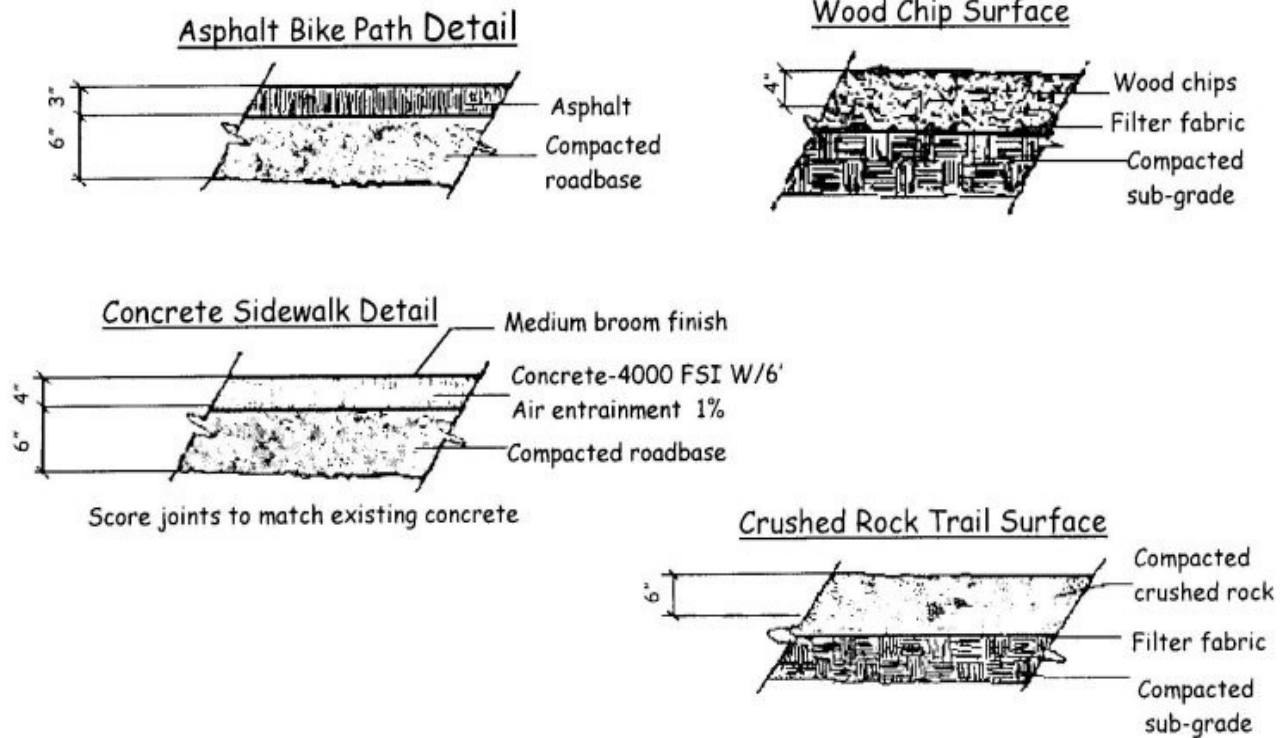
Passing #50 screen - 17-20%

Passing #100 screen - 13-17%

Passing #200 screen - 12-15%

Maximum water absorption - less than 3%

A six inch (6") compacted road base subgrade should be placed under the dirt surface in areas with a high water table or with poor drainage conditions. If a wood or other edging material is used along any of the trail surfaces, care will be taken to assure trail surface drainage. Edging is not recommended along soft surface trails because the soft surface changes over time causing the hard edge to impede drainage. Weed or root barriers also may be necessary.



NOTE: The crushed rock surfacing may be substituted with 2" of compacted dolomite limestone as per the specification.

(Ord. 2002-04, 3-20-2002)

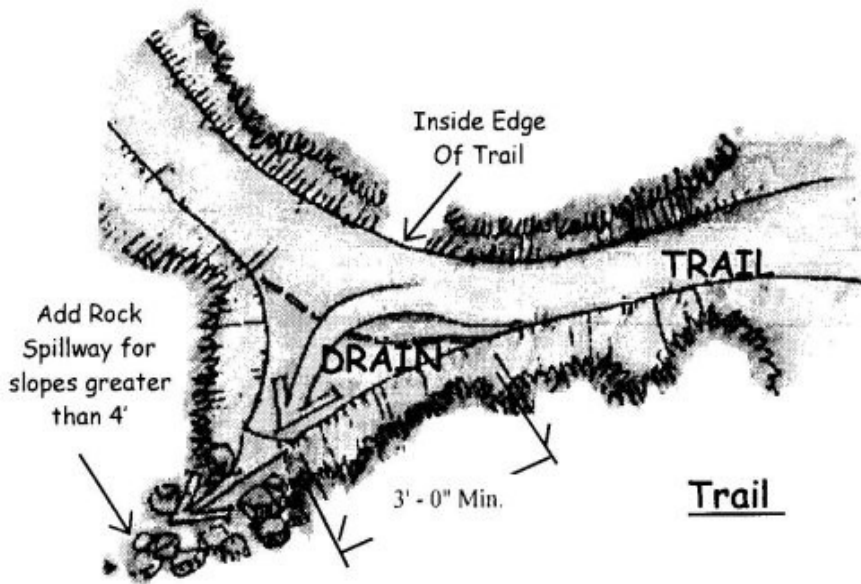
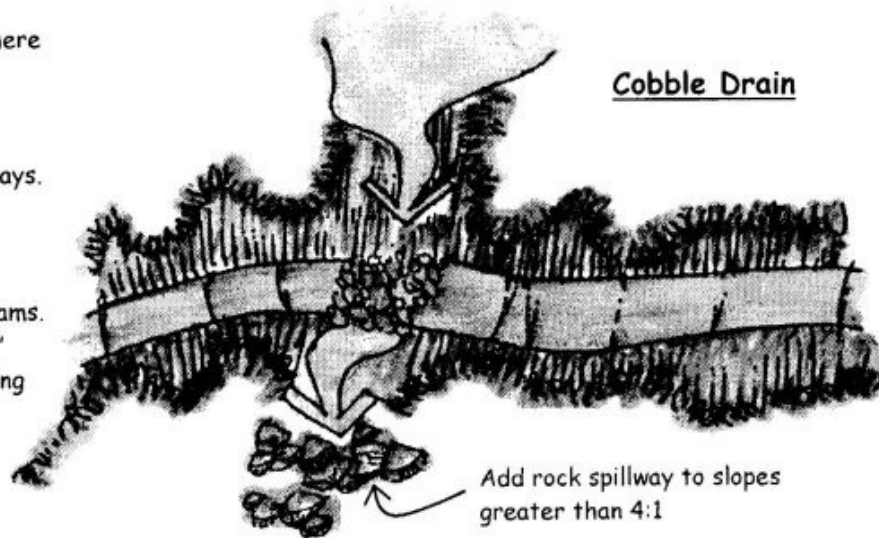
17.18.080: DRAINAGE PLANNING:

Careful study of topography adjacent to the trail may yield insight to maximize protection of the trail, while minimizing trail structures. General drainage should be studied at fifty (50) stations with provisions made to protect the trail.

A. Swells And Culverts: Drainage swells or culverts should be installed on trails at locations where the normal cross slope will not allow for adequate drainage. Drainage swells are not allowed on paved trails. Drains are best located at low points or bends in the trail along existing natural drainageways.

Wherever water is concentrated into new locations or in heavier concentrations, erosion protection needs to be evaluated and installed if necessary. Native stone is the preferred material.

Cobble Drain: Use where intermittent flow is expected, such as in pronounced gullies or established drainageways. Do not use where continuous flow is expected, such as at seeps, springs or streams. Cobbles shall be 2"-3" stones stockpiled during trail construction.



Trail Drain: Use where trail construction requires drainage such as along long and/or steep vertical ascents. Do not use where established drainageways exist. They are best if located at loss points or bends in trail. Transition from Trail to drain may require 6' at low points. 6' transition will be required up to normal trail.

B. Drainage Grates: Drainage inlet grates on bikeways will have openings narrow enough and short enough to assure bicycle tires will not drop into the grates (e.g., reticular type), regardless of the direction of bicycle travel.

C. Bicycle Safe Drainage Grates: Drainage grates should be installed where necessary to allow drainage and safe passage for bicycles.

17.18.090: SLOPE MANAGEMENT GUIDELINES:

When sloped areas are disturbed, the area needs to be stabilized and revegetated as part of the trail construction process to prevent subsequent soil erosion and frequent maintenance problems.

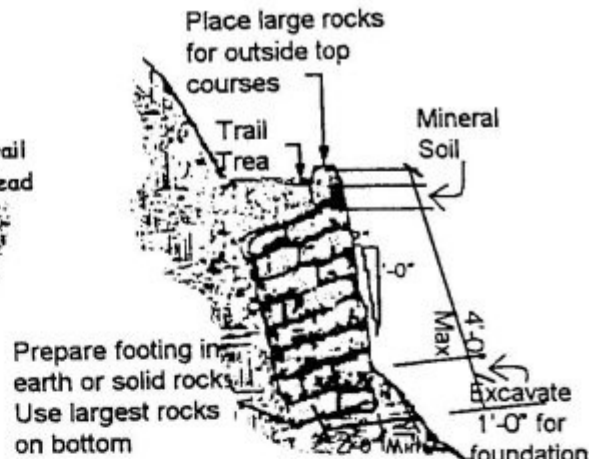
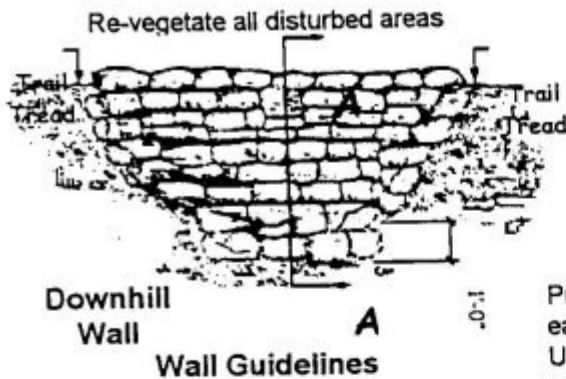
A. Permanent Slope Stabilization:

1. Retaining Walls: Permanent slope stabilization includes native stacked rock or wood retaining walls, rock filled gabions, wire baskets, wattling, planting or placing plant materials, and slope serration.

Where necessary for safety, retaining walls should be installed to prevent erosion of cut or fill slopes, to reduce cut and fill slopes or to minimize disturbance on environmentally or aesthetically sensitive sites. Retaining walls should be constructed of indigenous or natural materials. Walls located on visually sensitive sites should be designed to blend with the natural surroundings. Materials, texture, color, and height all affect the visual prominence of a retaining wall. Walls exceeding a height of four feet (4') must conform to the requirements set forth in the uniform building code.

Following are some guidelines for various techniques. All uninterrupted cut or fill slopes will not exceed six (6) vertical feet unless a site specific analysis is performed to justify otherwise. Some method of permanent slope stabilization should be required for all slopes in excess of two to one (2:1) vertical unless a site specific soils analysis is performed to justify otherwise.

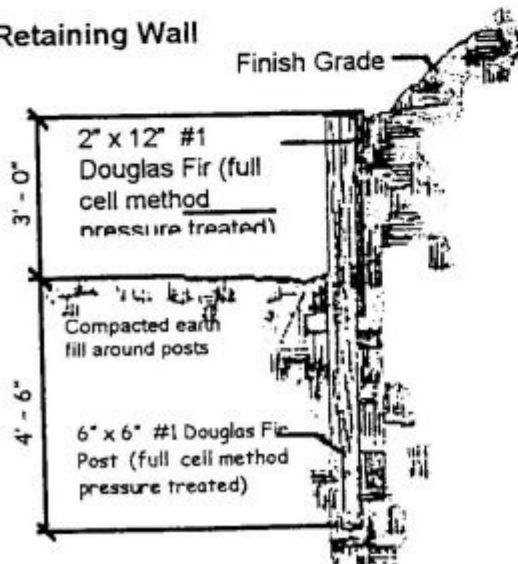
NOTES: Wall shall be 2" wide or ½ the wall height, whichever is greater



- Use stone which is native to the site wherever possible:
- To stabilize the trail in less than adequate situations.
- To widen a trail that otherwise would be too narrow.
- To taper up or down in areas where typical tread construction will not work.
- Walls should be built in areas where adequate footings can be dug.
- All stones should be angular free, free from defects, projections and impressions.
- Approximately 25-33% of wall should be tie stones.
- Maximum height of wall should be 4'-0"

- Use wherever natural trees or otherwise significant vegetation can be saved with the use of walls.
- Uniformly distribute sizes and shapes over the entire face of the wall.
- Shape stones for best fit. Use a 4" hammer if available.
- All walls must be battered: 3 in 12 through 12 in 12 are acceptable.
- Trench should slope inward as shown and drain to daylight. The stones shall completely penetrate wall. Miscellaneous backfill must be free from organic matter. Select backfill less than ½" maximum dimension, 4" depth optimum.
- Walls which are greater than 4'-0" in heights shall be engineered.
- Use where either cut or fill slopes for trail construction exceeds 4 vertical feet.

Retaining Wall



- Cut and fill slopes should be a maximum of 2:1 unless site specific soil analysis is performed to justify stability of steeper slopes.
- A maximum of 4 vertical feet of cut or fill is allowed environmentally or visually sensitive areas may be less.
- Areas which require steeper cut or fill slopes than the allowable shall use retaining walls as shown in these details.
- All disturbed areas shall be re-vegetated. Species for re-vegetation shall be appropriate and wherever possible shall match the surrounding species.

2. Cut And Fill Slopes: Combined cut and fill slopes should not exceed twelve (12) vertical feet and individual cut or fill slopes should not exceed six (6) vertical feet (less in environmentally and visually sensitive areas). Slopes that exceed these parameters should consider low retaining walls or alternate routing of the trail to a more acceptable location.

Cut or fill finish grades should not exceed a two to one (2:1) vertical unless a site specific soil analysis is performed to justify the stability of steeper slopes. All cut and fill slopes will be stabilized and revegetated as per the revegetation and slope stabilization guidelines.

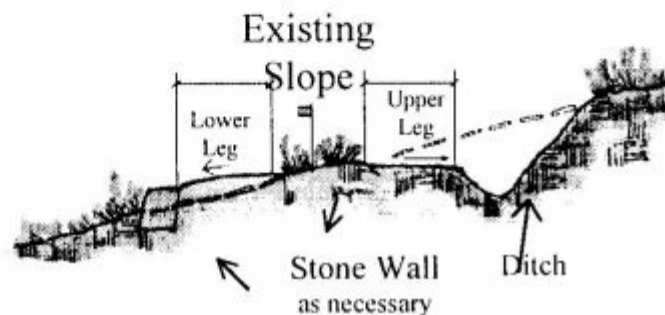
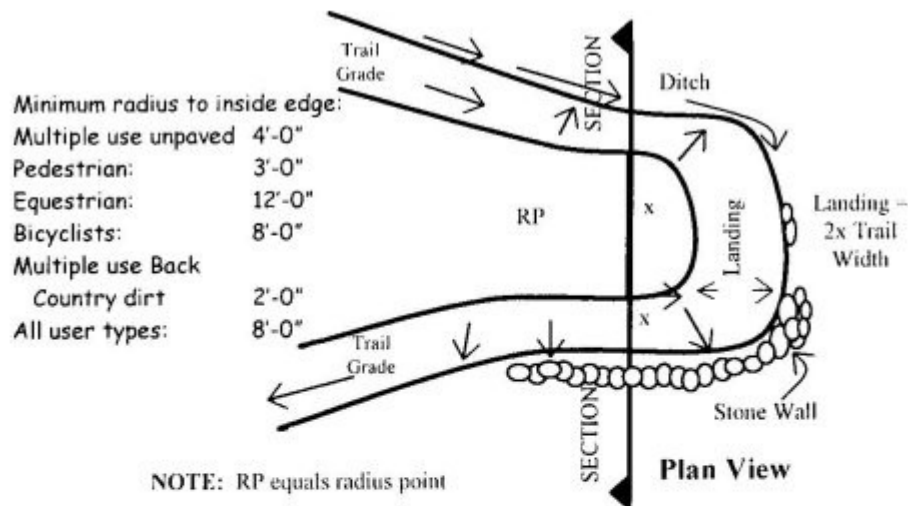
3. Existing Vegetation Protection: Existing significant vegetation that is to be saved will be protected with temporary fencing along the limits of disturbance. Trees that are to be saved should not be disturbed within the drip line of the tree, if possible, and the protective limits of disturbance fencing should extend to the drip line. Where this is not possible, all work within the drip line should be done by hand and mechanical equipment should not be allowed within the drip line. If filling is necessary above the root zone, perforated pipe along the drip line and vertical air wells should be installed. If cutting of roots or interception of natural drainage to the root zone is necessary, temporary irrigation may be required to compensate for the disturbance.

4. Temporary Runoff Management: During construction and establishment of revegetation, techniques, such as temporary erosion control, runoff measures, and slope stabilization may be necessary. Techniques, such as hydro mulching, straw mulch, jute matting, wood excelsior matting, tackifiers, straw bales, siltation fences, matting in drainage channels and stone mulching are examples of temporary runoff management. The following treatment guidelines provide some direction for the use of these measures. All are temporary measures and are intended to last from one to two (2) years until permanent stabilization techniques are effective.

5. Wattling: Bundles of branches are used to both stabilize and revegetate slopes that are nearly stable but continue to erode. Wattling is only recommended after initial methods have failed and where the unstable areas are minor.

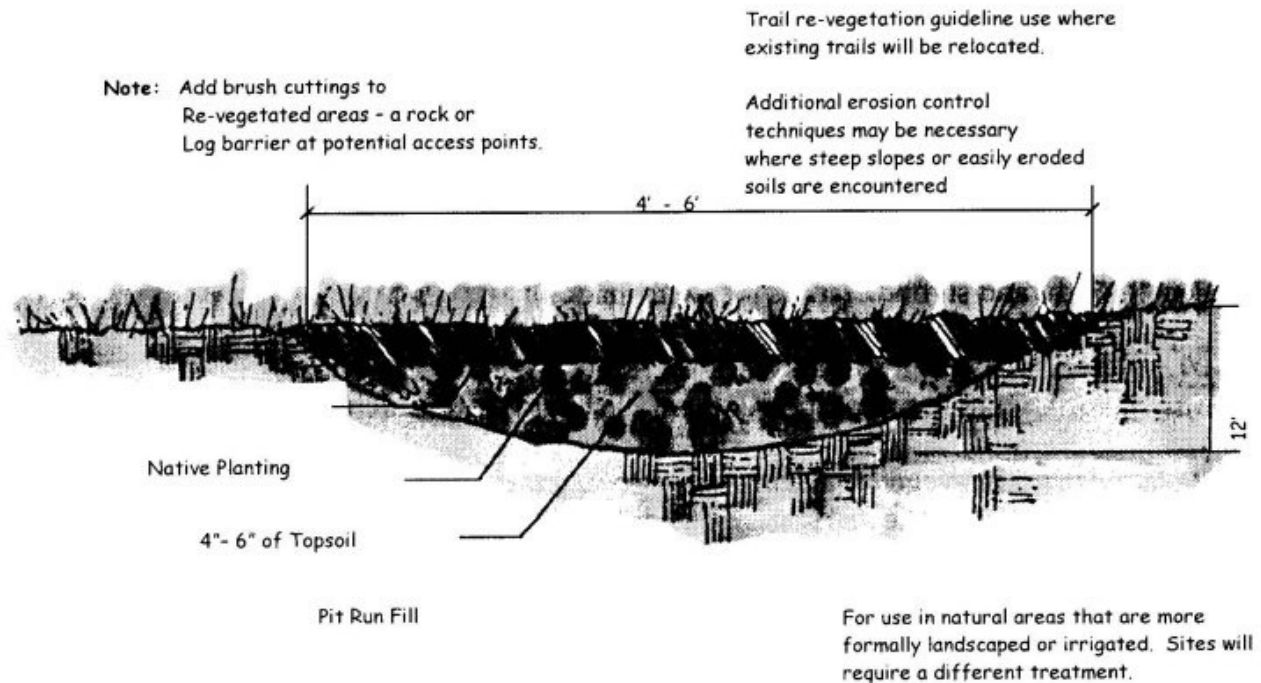
6. Slope Serration: Small steps or indentations are cut in the slope face and are useful for providing small favorable sites for vegetation establishment. This technique should be used only on soils that are fairly cohesive. Sites that have severe exposure to heat, sun or wind and have slopes that are excessively steep benefit most from this method.

7. Switchbacks: Switchbacks are expensive to construct but are necessary when steep slopes are encountered. When switchbacks are required, they should be designed to discourage crosscutting and subsequent erosion. Locate switchbacks where natural barriers exist: installing physical or visual barriers or providing sufficient separation between the switchbacks all help to discourage crosscutting. If crosscutting cannot be discouraged through design or construction then the installation of stairs or relocation of the trail should be considered.



8. Revegetation: Revegetation consists of seeding and planting operations. Seed and plant species and application rates will be submitted and approved with the construction plans. In general the revegetation of natural sites will match that of the undisturbed areas in species, density and vegetation patterns. Revegetation will be accomplished as soon as grading work is completed and weather permits. Unless the site is irrigated, native plant species indigenous to the site should be used. All revegetation work on nonirrigated sites will be done between October 15 and April 15 unless approval is granted otherwise. Sites that are revegetated between June 1 and September 1 will require temporary irrigation.

- Seedbed Preparation: Subgrade soils should be scarified to a depth of three to four inches (3-4") and topsoil placed to a minimum depth of four inches (4").
- Seeding: Seeds will be broadcast or hydro seeded and raked into topsoil before the application of mulch, matting or other surface stabilization materials. Seeding can be used for grasses and forbs, but container stock should be used for all trees and shrubs.
- Planting: Planting of container grown materials on nonirrigated sites will be confined to tubling stock unless there is sufficient natural moisture present to sustain larger plants.
- Maintenance: Revegetated sites will be maintained until sufficient establishment has occurred to reasonably stabilize the site. Security bond will be posted for all revegetation work for a minimum of one year at which time it will be reviewed and released if it meets the above requirements.



B. Temporary Slope Stabilization:

1. **Hydro Mulching:** Hydro mulching is a mechanized, rapid method for mulching large areas and is generally used with seeding to revegetate disturbed areas. Use may be limited on sites where equipment access is limited. Only one hundred percent (100%) wood fiber mulch will be used and applied at a rate of three thousand (3,000) pounds per acre.
2. **Straw Mulching:** Straw mulching can be used over small areas where it is applied by hand or on large sites where it is installed mechanically. Straw mulching is generally used in combination with seeding to revegetate disturbed sites. Straw must be held in place by matting, crimping or other method. Apply at a rate of two (2) tons per acre or a uniform depth of two to three inches (2-3").
3. **Jute Matting:** Jute matting can be used alone or in combination with hydro mulching or straw mulching for erosion control and slope stabilization. It is generally used in combination with seeding to revegetate disturbed areas. Apply up and down the slope, never along the slope. Overlap edges a minimum of four inches (4") and use wire staples that are a minimum of six inches (6") long and spaced approximately five feet (5') apart down the sides and middle of the role. Extend the mat a minimum of three feet (3') beyond the top and bottom of the slope and bury the mat end in an eight inch (8") deep trench at the top of the slope. Uniform contact of the mat to the slope underneath is critical.
4. **Wood Excelsior Matting:** Wood excelsior matting is used for erosion control generally in combination with revegetation. Care must be taken during installation to prevent concentrated flows under the mat. Apply up and down the slope, never along the slope. Edges should butt snugly together and held down with wire staples, a minimum of eight inches (8") long spaced approximately two feet (2') along the edges and four (4) down the center. Extend the mat a minimum of three feet (3') beyond the top and bottom of the slope and bury the mat end in an eight inch (8") deep trench at the top of the slope.
5. **Tackifiers:** Generally, tackifiers are mixed with mulches to provide better adhesion to steep and/or

windy slopes. Tackifiers should be applied at a rate of eighty (80) pounds dry ingredients per acre or two hundred (200) gallons wet ingredients per acre.

6. Straw Bales: Straw bales can be used in a variety of ways to protect areas from impact, straw bales reduce uninterrupted flow in low and intermittent flow channels. Straw bales also provide a siltation device for slopes or gullies until revegetation can be established. When installing, anchor bales in place with steel rebar stakes, driven a minimum of twelve inches (12") into the subgrade, in a six inch (6") deep trench which has soil tamped firmly along the uphill side.

7. Siltation Fences: Siltation fences are used to protect undisturbed down slope areas from up slope erosion.

8. Matting In Drainage Channels: Jute matting or fiberglass roving are typically installed in open drainage channels for temporary erosion control. Use this technique only where flow velocities do not exceed two feet (2') per second. Apply from the top and overlap edged a minimum of four inches (4"). Secure the top and bottom ends in an eight inch (8") deep trench secured with steel staples every twelve inches (12"). Edges should be stapled every two inches (2").

9. Stone Mulching: Stone mulching may be used during construction to control erosion, mud or dust.

10. Gabions: Gabions are rock filled wire baskets used to retain steep slopes or stabilize drainageways and may be preferable to stacked rock walls where the native rock is too small or too rounded for effective stacking. They are particularly effective when seepage is anticipated. Empty gabions are placed in position, wired together and filled with rock that is a minimum of four to six inches (4-6") in diameter. When used as a retaining wall the bottom basket should be buried a minimum of six inches (6") at the toe. Gabions should be keyed into the slope and laid back at a maximum of six inches (6") vertical to one inch (1") horizontal.

11. Bollards And Barriers: Barriers should be installed at trailheads to control access of motor vehicle traffic and to direct and/or protect trail users from steep or hazardous areas along the trail.

17.18.100: AMERICANS WITH DISABILITIES ACT INFORMATION AND STANDARDS:

In 1990, congress passed the Americans with disabilities act. Among other provisions, the act prohibits state and local governments from discriminating on the basis of disability and requires government services, programs, and activities to be accessible to people with disabilities. Technical assistance concerning the law's application is available by calling 1-800-USA-ABLE. Where potential use and/or ADA access needs warrant, provide trail access through, around, over or under major barriers. For pedestrians, add or improve sidewalks, create safe crossings, add ADA compliant ramps, and modify signalization and intersections where needed.

Almost fifteen (15) years ago, William Whyte wrote, "If circulation and amenities are planned with (the disabled) in mind, the place is apt to function more easily for everyone".

ADA guidelines recommend that to accommodate people in wheelchairs and with other disabilities, each street corner should include two (2) curb ramps. Midblock crossings should have curb ramps at each end. The city of Seattle now installs about four hundred (400) wheelchair ramps at pedestrian crossings per year.

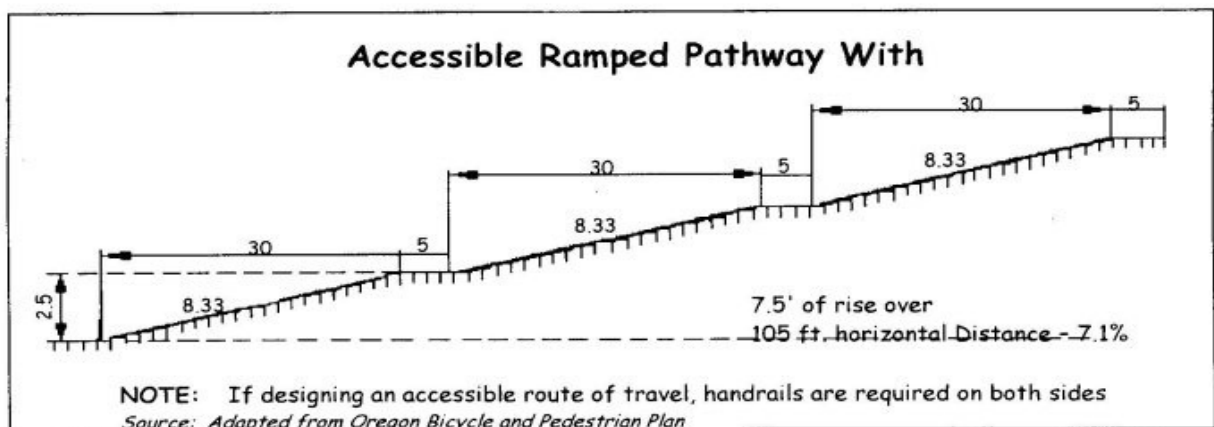
Alternatively, the crosswalk area can be raised to the level of the sidewalk. Such a raised crosswalk will have additional traffic calming benefits, serving as "speed tables" that will slow traffic speed at intersections.

A. Access For The Disabled: While it is clearly not practical for all types of trails in a mountainous

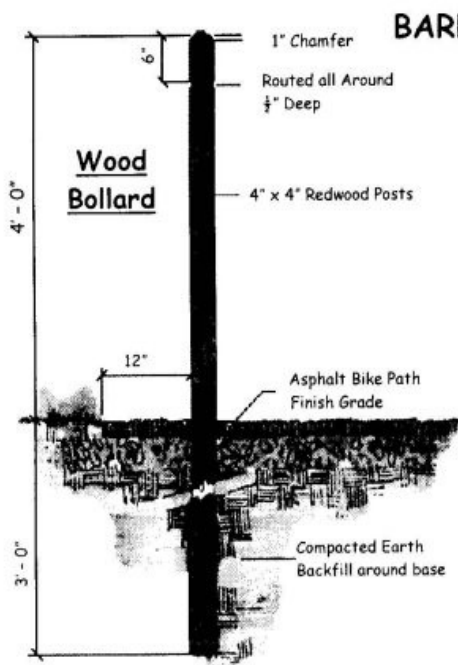
environment to be fully accessible to the disabled, where reasonably appropriate, the trail system should comply with the standards set forth in this law. Until such time as more definitive standards are set forth, this section of the master plan will provide a policy as to what trails are required to comply with this law and how Mapleton City will approach the improvement of trails. All new trails that provide access between new parking lots and new public facilities, such as recreation or institutional facilities, clubhouses, resort facilities, and commercial or business facilities are required to comply with ADA. All new trails providing access to new public, private and institutional transportation facilities also need to comply with ADA requirements. Trail renovation or new trails located in existing developed areas of the community should comply with the ADA standards.

A trail is considered ADA accessible if it meets the following criteria:

1. Five foot (5') minimum width.
2. Hard surfaces: Asphalt and concrete are the most accessible. Compacted crushed stone also works well, provided that the stones' diameter is less than three-eighths inches ($3/8"$). Loose gravel is not recommended.
3. Trail gradient should be no greater than five percent (5%).
4. Ramps, not stairs, should be provided for grades exceeding the five percent (5%) maximum.
5. Ramp grades should not exceed eight percent (8%) and have a level landing for every thirty inches (30") of vertical rise and have a slip resistant surface.
6. Thirty two inch (32") high handrails should be installed on all ramps and bridges.
7. Fully accessible trails should have a rest area every three hundred feet (300'), preferably cleared with a bench outside of the trail path with the distance between rest areas posted at the trailhead.
8. One or more accessible parking space should be provided at trail parking lots.
9. If gate or bollards are planned to prevent motorized vehicle access to the trail, maintain thirty two inch (32") clearance to ensure or provide wheelchair access.



(Ord. 2002-04, 3-20-2002)



BARRIER AND BOLLARD

Use where motorized access could be a problem, such as at trailheads, where trails intersect or cross streets and where trails parallel roads at points where access is likely.

Bollards are used within the trail surface to prohibit or limit access.

Use along trail where downslope grades are steep and hazardous.

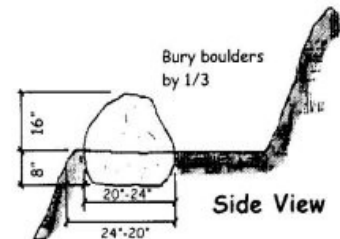
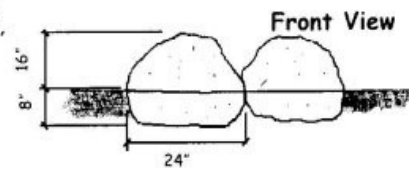
Use along outside edge of trail curves where slopes are steep and exposed.

Use where switchback cutting could be a problem.

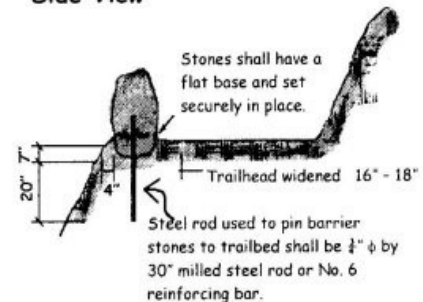
Use at trailheads or road crossings to discourage or prohibit motorized access.

Use to direct trail users to stay on the trail.

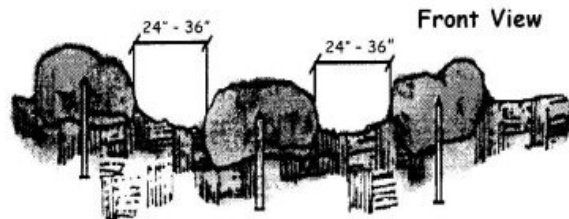
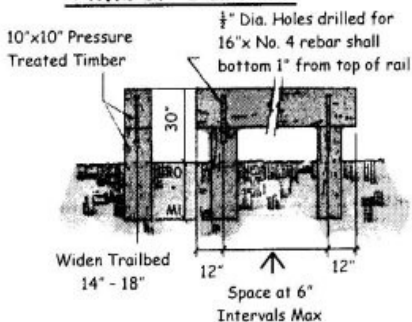
Rock Barriers



Side View



Timber Barrier



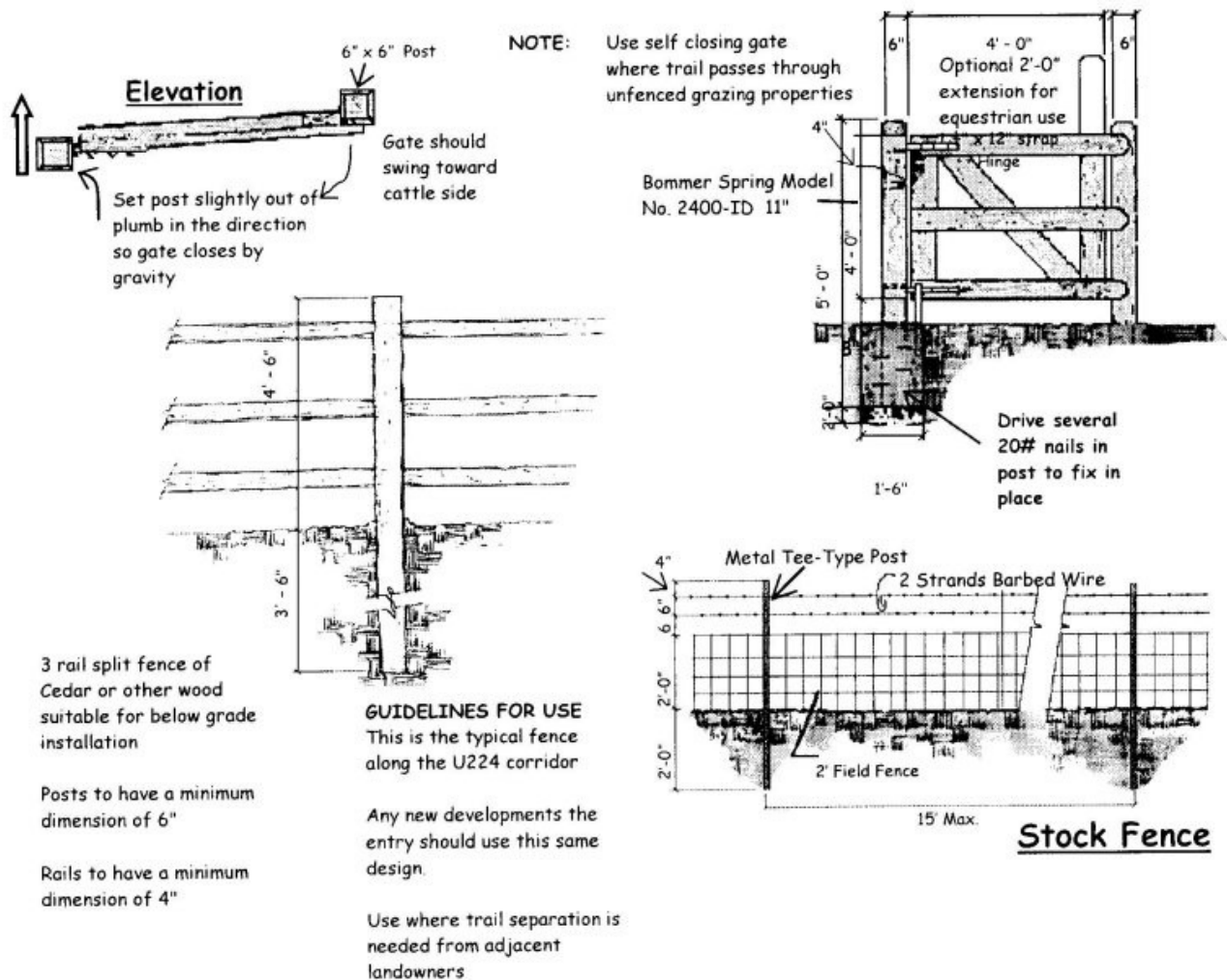
Note: Size of barrier stones shall be approximately 14"-24" in height, width and length. Minimum dimensions shall not be less than 12" for height and width and 18" for length.

Three (3) types of barriers are generally used: large boulders, timber barriers and wood bollards. All three (3) types of barriers are effective in stopping motorized access when placed at the trailhead. The location of such barriers is usually where trails intersect or cross streets and where trails parallel roads at points where access is likely. Rock barriers can also be used along portions of a trail where the down slope grades are hazardous, where switchback cutting can be a problem and along outside edges are exposed to steep slopes. The placement and spacing of barriers are dependent upon unique trail site characteristics and use requirements.

12. Fencing: Fencing should be installed only where physical separation is necessary for safety and/or to preserve adjacent landowner privacy. Fences should not create a narrow corridor effect for long stretches along the trail. Where possible fencing should be located only on one side of the trail at a time.

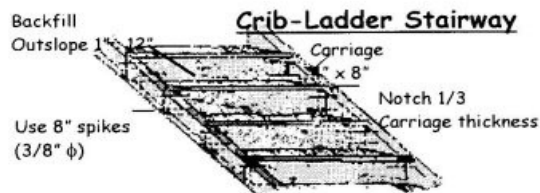
Fences should be no closer than five feet (5') from the trail edge. Where fences are necessary along both sides of a trail, the minimum width should be twenty feet (20').

Gates are required for trails that cross stock grazing area. They will be a self-closing lever latch type gate, such as those manufactured by Powder River or another manufacturer with similar design characteristics.



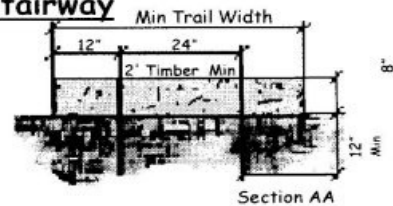
13. Stairways: Trails in excess of the slopes indicated on the trails matrix should consider stairways. Stairways may be required to conform to the requirements set forth in the uniform building code. Stairs should not be used on trails that are used by horses, road bikes or the disabled.

a. Wooden Stairs: Will be constructed of pressure treated or approved rot resistant timber.



NOTE: Where stairs are located in developed areas of the community, compliance with the uniform building code is required.

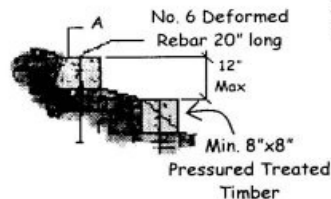
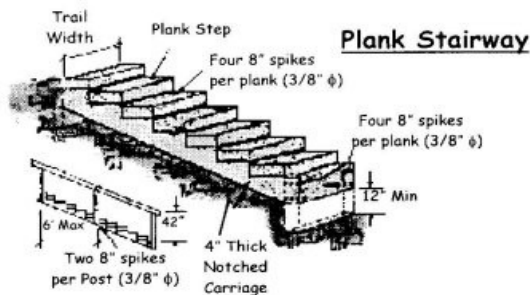
Pinned Stairway



Treads to be dug into the slope and set into place.

Drill holes through each tread for each rebar stake.

Drive rebar stakes through treads and into ground below.



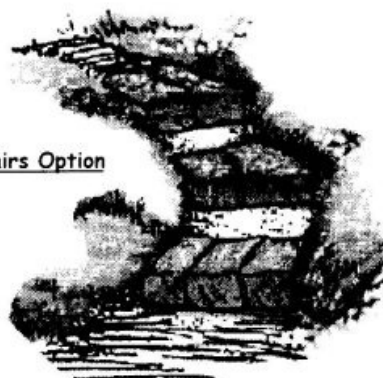
b. Stone Stairs: Can be used where trail grades exceed the maximum allowable slopes and where the grade must be gained quickly. Stone stairs should be built with the intent that intensive use should not impact the stairs in the slightest.

Stone Stairs:

Details are included for reference only. Choose stones with a good shape for stairs. Minimum sizes are shown, start at the bottom and work up. Use the biggest stones possible to span the trail. One stone would be the best, two are fine and three is maximum.

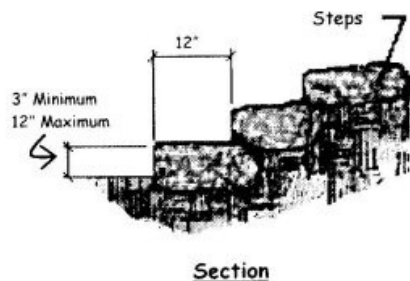
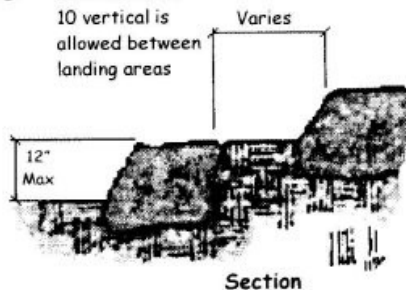
Completely cross the trail. Route the trail so people will stay on the trail and stairs. Build to the dimensions shown and make each set of stairs are uniform. Keep the height of each step and the distance between steps as uniform as possible within each set of stairs. Maximum grade at top and bottom of stairs as well as between stairs should be 8%. Walk your staircase to ensure it is smooth and uniform.

Stairs Option

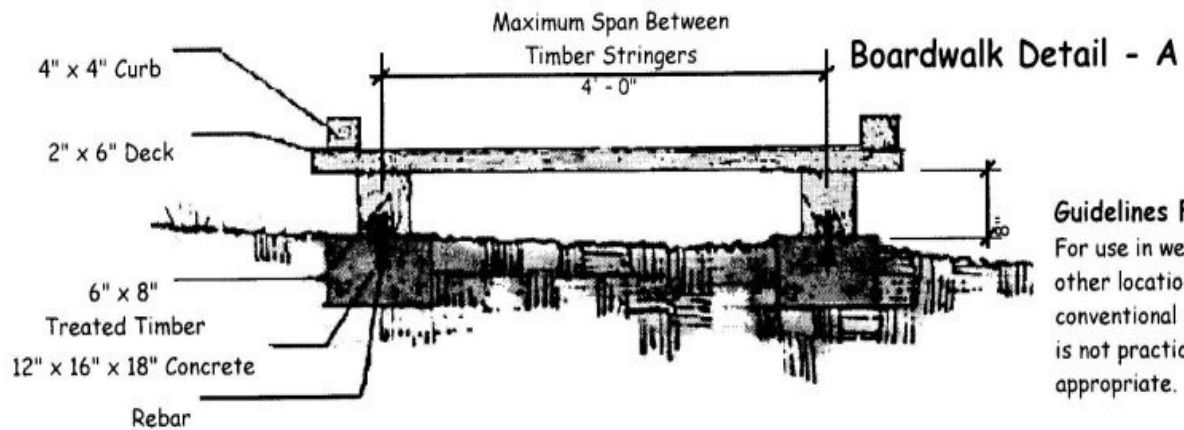


Stone Stairs for Back Country

NOTE: A maximum of 10 vertical is allowed between landing areas

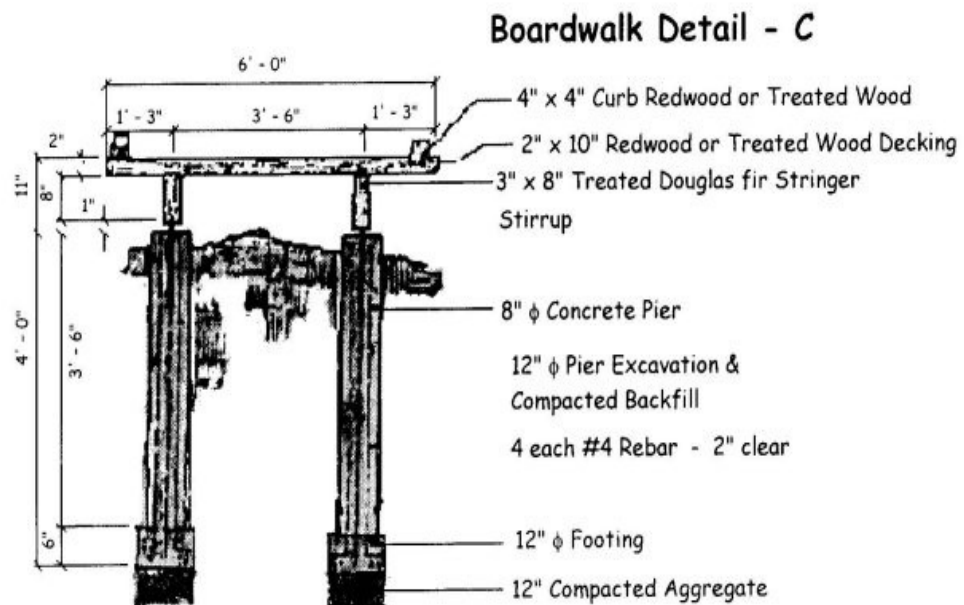
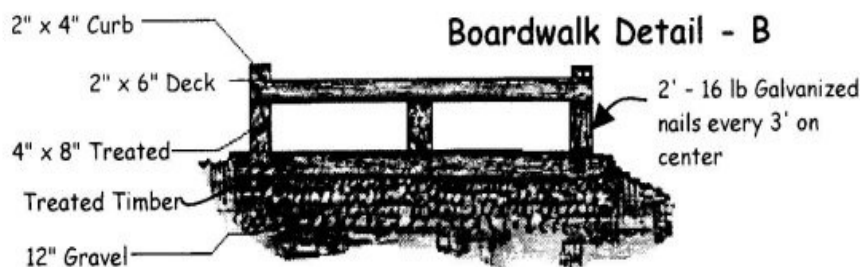


14. Boardwalks: All wood used in boardwalk construction will be pressure treated or approved rot resistant timber.



Guidelines For Use
For use in wetlands or other locations where conventional pavement is not practical or appropriate.

Do not use where motorized vehicles or horses are expected.



15. Root Barriers: Root barriers should be installed along the edges of trails where riparian or vegetation that aggressively seeks out water is present. Willows, Gamble's oak, aspens and cottonwoods are examples of aggressively spreading plants. In situations where irrigated land is on one side of the trail and nonirrigated land is on the other, water seeking vegetation in the nonirrigated side

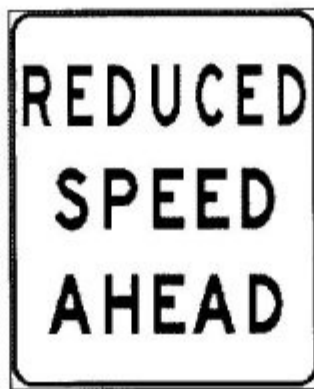
may send roots to the irrigated side, a root barrier should be installed. (Ord. 2002-04, 3-20-2002)

17.18.110: SIGNS AND PUBLIC MAPS:

Locations for signs need to be evaluated on a case by case basis and signs should only be posted where necessary to avoid visual pollution. These guidelines provide general direction for signs and their placement.

Signage on privately constructed trails will be purchased by local cities, Mapleton City or UDOT, and given to the contractor constructing the trail for installation. The building department should maintain a stock of commonly used signs. Contractors should notify the building department a minimum of thirty (30) days prior to trail completion to assure the signs they need are available.

A. Regulatory Signs: Requirements for the use and placement of signs, including regulatory signs at intersections, will follow the standards set forth in the "Manual On Uniform Traffic Control Devices" (MUTCD) section on "Traffic Control Devices For Bicycle Facilities" and will apply to all multiuse paved trails. Bicycle crossing signs near a road approaching a crossing will conform to MUTCD standards. The following information lists the types of regulatory signs and describes where they should be located:



Examples of other signs available. Copy and graphics can be altered to fit your needs and size.



1. Stop Signs: Stop signs will be installed wherever paved multiple use trails cross public streets, unless

traffic is required to stop at trail intersections or at other potentially hazardous locations.

2. Speed Limit, Steep Grade, Danger Warning, And Slow Signs: These signs should be installed where trails approach maximum slopes, areas with limited sight distance and areas with dangerous conditions ahead, such as "Moose Crossings".

3. Curve Signs: Trail users should be cautioned by signs when a curve has a smaller than recommended travel radius and/or limited sight distance. Curve signs should be posted at points along the trail where travel at a moderate rate would cause a trail user to leave their lane.

4. Dismount Signs: Such signs should be posted in areas where slope exceeds recommended standard and where trail width or vertical clearance is less than the recommended standard.

5. School Zone Signs: For the safety of school children and trail users, school signs should be posted near schools.

6. Private Property Signs: Signs identifying private property should be located on an "as needed" basis.

All regulatory signs should have engineer grade reflective coating and be graffiti proof. Sign size and letter height should conform to the speed of traffic along the trail.

B. Informational Signs:

€ Signs indicating allowed uses should be posted at trailheads.

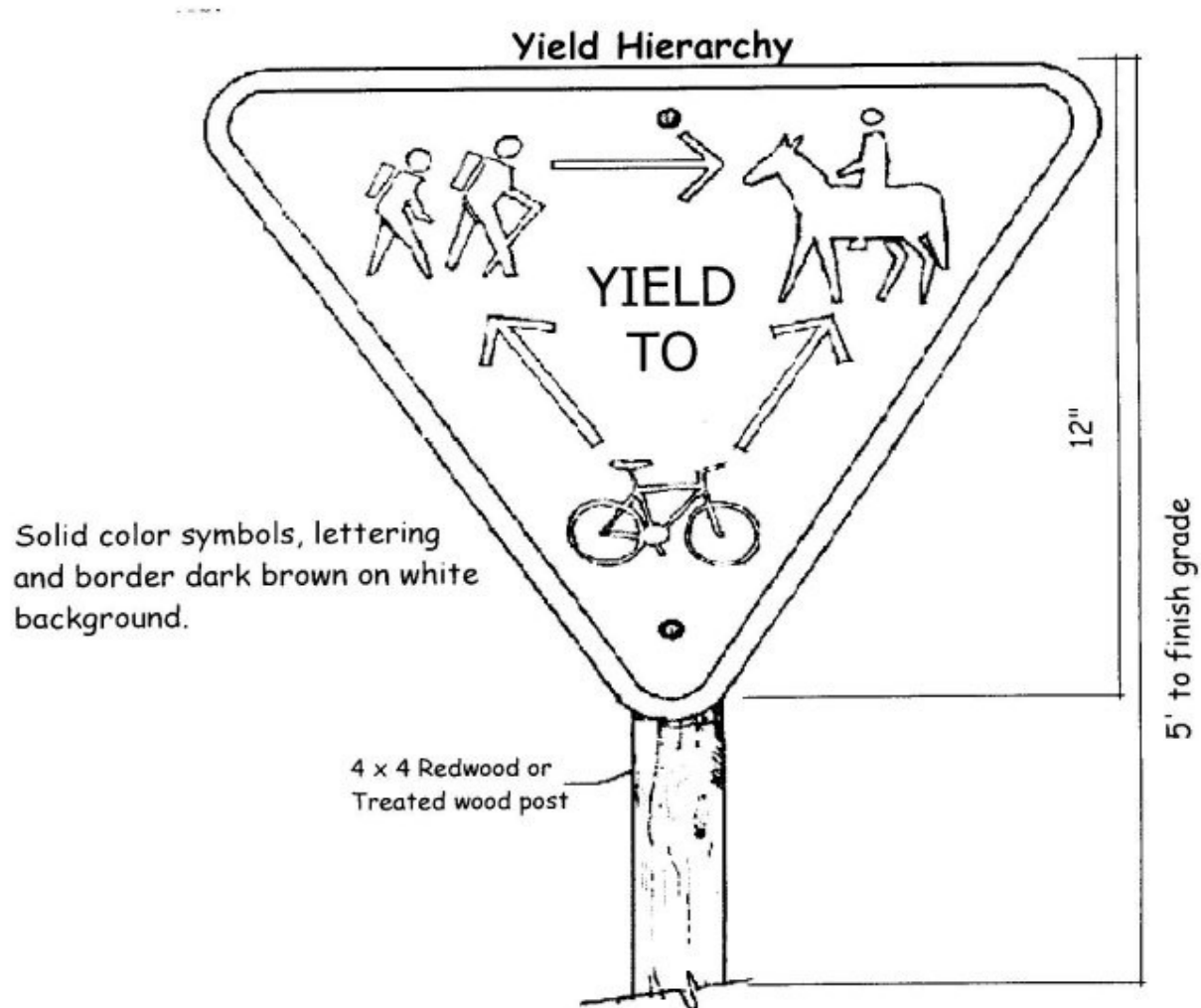
€ At high volume multiple use trailheads, informational signs indicating user etiquette should be posted.

1. Trail User Information Sign: This sign should be placed at all major trailhead facilities and city parks where trails are accessed. It should be located where it is clearly visible and where it does not impede trail use or present a hazard to trail users.



2. Yield Hierarchy Sign: This sign should be placed at all major access points of multiple use trails. It

should be located where it is clearly visible and where it does not impede trail use or present a hazard to trail users.



3. Trail Courtesy Sign: Trail courtesy signs should be posted at all trailheads. A shortened user courtesy sign should be installed at trail access points. This sign can be placed on the same post as the "Yield Hierarchy Sign", wherever the trail user information sign is not located. The trail courtesy sign should also be located on "Stop" and "Private Property Signs".

REMEMBER TRAIL COURTESY

- 1. IF IN DOUBT YIELD**
- 2. RESPECT HORSES**
- 3. RIDE SAFELY AND AWARE**
- 4. ALERT OTHERS WHEN
APPROACHING**
- 5. LEAVE NO TRACE**